



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,343	10/30/2003	Philip H. Harding	100202933	7518

22879 7590 02/10/2006

HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
----------

ANTHONY, JOSEPH DAVID

ART UNIT	PAPER NUMBER
----------	--------------

1714

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/697,343

Applicant(s)

HARDING ET AL.

Examiner

Joseph D. Anthony

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.  
4a) Of the above claim(s) 14-40 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-13 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I, claims 1-13 in the reply filed on 11/21/05 is acknowledged.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 7, and 9-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Petillo et al. U.S. Patent Application Publication No. US 2004/0047801 A1.

Petillo et al teach hydrogen is generated through the use of a fuel solution that is prepared using solid fuel component, e.g., a metal borohydride, and a liquid fuel component, e.g. water. Both of these components are dispensed in response to control signals. The solid fuel component can take different forms, including but not limited to granules, pellets and powder. Various devices, which operate in response to control signals, are disclosed for dispensing predetermined amounts of the solid and liquid components. Advantageously, this solution can be prepared, as needed, so as to obviate the need for storing and disposing of large amounts of highly alkaline fuel and discharged fuel solutions, see abstract, sections [0004]-[0007], [0016]-[0017], and [0039]-[0040] and the claims. Applicant's fuel pellet package is deemed to be anticipated over the solid fuel component dispenser 102 shown in FIG. 1 in combinations with the fuel storage tank 101 in FIG. 1. Note FIG. 3 which shows a diagram of the solid fuel component dispenser. Also note that claims 11-13 are properly rejected here

even though the reference does not seem to disclose using electrically energy or heat without water to activate the hydride fuel. The reason for this is that applicant's invention is drawn to a fuel pellet package and not to the entire fuel cell apparatus. As such, applicant's claimed limitation on the position of the fuel pellet package within a fuel cell is deemed to be moot.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petillo et al. U.S. Patent Application Publication No. US 2004/0047801 A1 optionally in view of Hallin U.S. Patent Number 6,889,869.

Petillo et al has been described above and differs from applicant's claimed invention in that there is no direct teaching to a solid fuel component dispenser that has a second spring as claimed by applicant.

Hallin teaches a tablet dispenser comprising an elongate container (10) for tablets (12) and a dispensing device for discharging tablets out of the container (10). The dispensing device includes an operating unit (11) for manual action, a joint mechanism (14) connected to the operating unit (11), and a slide (15) projecting from the joint mechanism (14) for accommodating and dispensing a tablet (12). The operating unit (13), the joint mechanism (14) and the slide (15) are of one-piece manufacture. Note that the tablet dispenser has two springs.

It would have been obvious to one having ordinary skill in the art to use the broad disclosure of Petillo et al as motivation to make a solid fuel component dispenser having a second spring if desired since such second springs are well

known in the dispenser art and Petillo et al's single spring dispenser was given by way of illustration not by way of limitation. In the case, it would have been obvious to combined the teaching of Hallin to making and using table dispensers that have two springs as motivation to actually add a second spring the Petillo et al's dispenser for the benefits that the second spring to confer.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petillo et al. U.S. Patent Application Publication No. US 2004/0047801 A1 optionally in view of anyone of the following: Litz et al. U.S. Patent Number 3,459,510 or U.S. Patent Application Publication US 2005/0036941 A1 or Adhart U.S. Patent Number 5,833,934.

Petillo et al has been described above and differs from applicant's claimed invention in that there is no direct teaching to further adding a desiccant to absorb moisture away from the plurality of fuel pellets.

Litz et al teach a portable, self-contained apparatus for the generation of hydrogen gas by reacting a solid metal hydride fuel with a liquid. The further incorporation of a desiccant is directly taught, see column 2, lines 47-63.

Bae et al. teach a hydrogen generator apparatus which includes a solid hydrogen source that can be in the form of tablets. The hydrogen generator can also have a wicking material (e.g. a hydrophilic material that would function as a desiccant) that could be a separate layer from the hydride tablets, see abstract, sections [0006]-[0008], [0028]-[0030] and [0037]-[0038].

Adhart teaches the reaction of alkali, alkali-earth metal hydride with water is utilized for the generation of hydrogen in a novel generator configuration. This overcomes the problems encountered in earlier hydride based generator configurations inasmuch as it overcomes the problem associated with the expansion of the hydride upon its conversion to hydroxide or oxide when reacting with water. This is accomplished by using a hydride cartridge of unique configuration. The combination of the corrugated cartridge structure and the wicking material dispersed throughout the cartridge facilitate (can be in the form of a separate layer from the solid hydride material) the complete utilization of the hydride and water in a demand responsive mode. This is important in applications where intermediate hydrogen storage is impractical, as is the case in the use of these generators--e.g., for electric power generation in fuel cells in general and for Underwater Vehicles specifically because space restraints, see abstract and column 2, lines 4-53.

Applicant's claims are deemed to be obvious over Petillo et al alone because it is well known by those having ordinary skill in the art that many metal hydrides, such as applicant's calcium hydride are well known desiccants themselves. As such the outer metal hydride tablet in the stack of tablets could function as a desiccant. This interpretation is consistent with applicant's claimed limitation of "a desiccant to absorb moisture away from the **plurality** of fuel pellets" [emphasis added].

In the alternative anyone of the secondary references can be combed with Petillo et al to supply motivation to actually add a desiccant or hydrophilic material to absorb moisture away from the plurality of fuel pellets. This is true even in regards to the

wicking components taught by Bae et al and Adhart, since such wicking components would perform applicant's claimed function prior to the deliberate addition of water to activate the hydride component to generate hydrogen.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petillo et al. U.S. Patent Application Publication No. US 2004/0047801 A1 in view of Wessel et al. U.S. Patent Application Publication No.: US 2002/0164521 A1.

Petillo et al has been described above and differs from applicant's claimed invention in that there is no direct teaching to further adding of a passivating material disposed between each of adjacent ones of the plurality of fuel pellets.

Wessel et al teach application of two-dimensional materials (TDMs) that are exfoliated transition metal dichalcogenides in electrochemical fuel cells to remove contaminants that are harmful to the fuel cells; to effect proper transport and containment of various fluids in fuel cells to achieve proper and efficient operation; to protect various surfaces and materials commonly comprised in or used for fuel cells and critical to their operation; and to purify and lower the freezing point of cooling water used for the fuel cell stacks. Disclosed are methods whereby the TDM is used as a barrier to prevent unwanted crossover (between electrodes through a polymer electrolyte membrane or PEM) of chemical species; where the TDM is used to coat and/or encapsulate catalyst particles, carbon catalyst support, PEMs, and chemical or metal hydrides, to protect the same from unwanted exposure to chemical species; and where the



Art Unit: 1714

TDM is used to purify and lower the freezing point of fuel cell stack cooling water.

Also disclosed are products related to the above and comprising the TDM, see abstract, sections [0011], [0020] and [0028].

It would have been obvious to one having ordinary skill in the art to use the direct disclosure of Wessel et al as motivation to actually add two-dimensional materials (TDMs) that are exfoliated transition metal dichalcogenides (i.e. passivating materials) between each of adjacent ones of the plurality of fuel pellets as disclosed by Petillo for the benefits that such would cause.

***Prior-Art Cited But Not Applied***

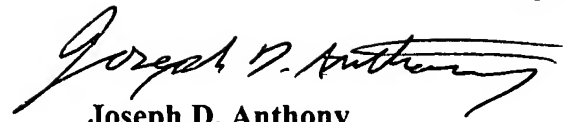
8. Any prior-art reference which is cited on FORM PTO-892 but not applied, is cited only to show the general state of the prior-art at the time of applicant's invention.

***Examiner Information***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Joseph D. Anthony whose telephone number is (571) 272-1117. If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (571) 272-1119. The centralized FAX machine number is (571) 273-8300. All other papers received by FAX will be treated as Official communications and cannot be immediately handled by the Examiner.

Application/Control Number: 10/697,343  
Art Unit: 1714

Page 9



**Joseph D. Anthony**  
**Primary Patent Examiner**  
**Art Unit 1714**

2/6/06